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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/080,226 | 02/21/2002 | Thomas F. Soules | 11595 GEC 2 0609 | 8341 |

7590 10/21/2003
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EXAMINER

MACCHIAROLO, PETER J

ART UNIT PAPER NUMBER

2875

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/080,226 | SOULES ET AL. | |
| | Examiner | Art Unit | |
| | Peter J Macchiarolo | 2675 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133)
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). ____. |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-946) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>0702</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on July 15, 2002 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the method of manufacturing the lamp in claims 17-19 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

3. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 5, 14-16, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by de Hair et al (USPN 4,602,188; "de Hair").

5. In regards to claims 1, 2, 5, 14-16, and 19, de Hair discloses in the abstract and figure 3, a mercury vapor discharge lamp comprising an envelope (1), means for providing a discharge (3, 2) a discharge-sustain fill of mercury and an inert gas sealed inside the envelope, a phosphor containing layer (4) coated inside the envelope, including a blend of a blue-green emitting halophosphate (abstract, c), a red emitting phosphor (abstract, a), a green emitting phosphor (abstract, b), and a white emitting halophosphate (abstract, c). Further, de Hair discloses in the abstract that the red emitting phosphor includes a rare-earth phosphor, the phosphor blend is free of blue-emitting rare earth phosphors, and that the lamp has a CRI of 80¹.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 11-13, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Hair.

7. In regards to claim 3, de Hair discloses all of the recited limitations of claim 1 (above).

8. de Hair is silent to the specific values of elements that comprise the blue-green halophosphate being activated by Sb.

9. However, the Examiner takes Official Notice that calcium halophosphate (blue halo) is known to one of ordinary skill in the art, and discovering Applicant's general formula would

¹ De Hair, col. 1, ll. 14-20.

have been obvious, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

10. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the lamp of de Hair, including the general formula of Applicant, since blue halo is known, and discovering the optimum or workable ranges involves only routine skill in the art.

11. In regards to claims 11-13, de Hair discloses all of the recited limitations of claim 2 (above).

12. de Hair is silent to the specific weight percent of the white emitting halophosphate present in the phosphor blend.

13. However, one of ordinary skill in the art would arrive at the white emitting halophosphate being about 70% by weight in the blend of phosphors, since changing the white emitting halophosphate weight percent in the phosphor blend is known to change the color temperature of the emitted radiation, and further, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

14. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the lamp of de Hair and optimizing the weight percent of the white emitting halophosphate, since this will allow for a market specific, desired color temperature.

15. In regards to claims 17 and 18, de Hair discloses in the abstract and figure 3, a lamp comprising a blend of phosphors, the blend of phosphors including a blue-green emitting halophosphate, a red-emitting phosphor, a green-emitting phosphor, and a white emitting halophosphate, a coating comprising the blend of phosphors on a wall of an envelope (1), and sealing a fill inside the envelope, the fill including mercury and an inert gas.

16. While de Hair is silent to a method of manufacturing such a device, Applicant's steps of forming the coating is very broad. Hence, the structure disclosed by de Hair meets Applicant's recited method step limitations.

17. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the lamp structure of de Hair, with the method of claim 17, since the method steps are obvious in light of the resultant structure.

18. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over de Hair in view of McSweeney (USPN 5,232,626; "McSweeney").

19. In regards to claim 4, de Hair discloses all of the recited limitations of claim 2 (above).

20. de Hair is silent to a general formula for the white-emitting calcium halophosphate.

21. However, McSweeney teaches that a white-emitting calcium halophosphate has a general formula $\text{Ca}_{9.79}(\text{PO}_4)_3\text{F}_{1.85}\text{Cl}_{0.4}\text{O}_{0.06}:\text{Mn}_{0.15}\text{Sb}_{0.12}$ which meets Applicant's limitations, and furthermore, McSweeney teaches that this composition is more durable during a manufacturing process and retains its brightness².

² McSweeney, col. 2, ll. 27-44, and col. 1, ll. 49-55.

22. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the lamp of de Hair, using the white-emitting phosphor of McSweeney, since this phosphor is more durable during a manufacturing process and retains its brightness.

23. Claims 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Hair in view of Shimizu et al (USPN 6,224,240; "Shimizu").

24. In regards to claims 6 and 7, de Hair discloses all of the recited limitations of claim 5 (above).

25. de Hair is silent to the green phosphor, which is activated by Tb, being one of the recited phosphors. Further, de Hair is silent to the red phosphor, which includes yttrium oxide, being activated by Eu.

26. However, Shimizu discloses that a green phosphor which consists of lanthanum phosphate and activated with cerium (3+) and terbium (3+), and a red phosphor which consists of yttrium oxide activated with europium (3+) are commonly used phosphors in a fluorescent lamp, and further that these phosphors are very efficient while ensuring proper recognition of colors at a minimum level³.

27. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the lamp of de Hair, including the phosphors of Shimizu, since these phosphors are very efficient while ensuring proper recognition of colors at a minimum level.

³ Shimizu, col. 10, ll. 8-18, and col. 2, ll. 57-64.

28. In regards to claims 8-10, de Hair discloses all of the recited limitations of claim 5 (above).
29. de Hair further discloses that the red and green emitting phosphors are both rare earth phosphors.
30. de Hair is silent to the specific ratio of the halophosphate to rare earth phosphors in the lamp.
31. However, Shimizu discloses that emission efficiency of the lamp decreases as the proportions of LAP (Shimizu's chemical formula 1) and YEO (Shimizu's chemical formula 2) with respect to the rare-earth element phosphor increase⁴. Although Shimizu is silent to the exact ratio, one of ordinary skill in the art would be able to obtain an optimum ratio, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.
32. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the lamp of de Hair, including the recited ratios, since Shimizu teaches there exists an optimum value of LAP, YEO, and rare-earth element phosphor, and discovering the optimum or workable ranges involves only routine skill in the art.

Conclusion

33. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

⁴ Shimizu, col. 20, ll. 8-14.

34. U.S. Patent 5,612,590 published March 18, 1997 to Trushell et al discloses a lamp having a blend of phosphors. This reference is evidence to support the Examiner's statement that blue halo is known in the art (see col. 4, ll. 14-17, and ll. 29-30).

35. U.S. Patent 4,800,319 published January 24, 1989 to Van Kemenade et al discloses a lamp having a blend of phosphors. This reference is evidence that optimizing the white emitting halophosphate in a blend of phosphors is known in the art.

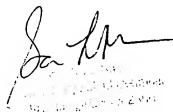
36. U.S. Patent 5,049,779 to Itsuki et al discloses a phosphor blend used in a fluorescent lamp that is extremely similar to Applicant's. However, this reference is not relied upon in this office action.

37. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Macchiarolo whose telephone number is (703) 305-7198. The examiner can normally be reached on 7:30 - 4:30, M-F.

38. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703) 305-4939. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

39. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

pjm

A handwritten signature in black ink, appearing to read "Peter J Macchiarolo", is written over a faint, circular official stamp. The stamp contains text that is mostly illegible but appears to include "UNITED STATES PATENT AND TRADEMARK OFFICE" and "WASHINGTON, DC 20590".